CLAIMS

I claim:

1. A stent fabrication method comprising the steps of:

(a) coating an outer surface of a metallic tubular member with a photo-sensitive resist resulting in a coated tubular member, said metallic tubular member having an outside surface, an inside surface and an inner lumen;

(b) placing said coated tubular member in an apparatus which simultaneously exposes a selected portion and shields other selected portions of said outer surface of said coated tubular member to a light source, yielding a partially exposed tubular member;

(c) immersing said partially exposed tubular member in said photo- resist developer resulting in a treated tubular member;

(d) sealing said inner lumen; and

(e) processing said treated tubular member by a chemical or electro-chemical etching process to remove metal located in said selected portions of said tubular member.

2. A stent fabrication method as recited in Claim 1, further comprising the step of processing said tubular member with a plasma etch treatment prior to the step of coating said outer surface of said metallic tubular member with said photo-sensitive resist.

3. A stent fabrication method as recited in Claim 1, further comprising the step of coating said outer surface of said tubular member with a coupling agent prior to the step of coating said outer surface of said metallic tubular member with said photo-sensitive resist.

4. A stent fabrication method as recited in Claim 1, further comprising the step of incubating said treated tubular member in a temperature range, said temperature range being between 100 and 400 degrees Celsius, after the step of immersing said partially exposed tubular member to said negative resist developer.

5. A stent fabrication method as recited in Claim 1, wherein said exposure of said light source to portions of said coated tubular member is regulated by a pattern imprinted on photographic film.

6. A stent fabrication method as recited in Claim 2, further comprising the step of heating said tubular member in a temperature range, said temperature range being between 100 and 200 degrees Celsius, after the step of cleaning the tubular member.

7. A stent fabrication method as recited in Claim 1, wherein said light source has a wavelength within the range of 360 to 440 nanometers.

8. A stent fabrication method as recited in Claim 1, wherein said light source has a preferred wavelength optimized for the specific photoresist employed.

9. A stent fabrication method as recited in Claim 3, wherein said coupling agent comprises a class of organo-silane compounds.

10. A stent fabrication method as recited in claim 1, wherein a plurality of stents are made from a single piece of tubing.

11. A stent fabrication method as recited in claim 1, wherein said tubular member is made from a material selected from the group consisting of polymers, stainless steel, titanium, platinum, gold alloys, gold/platinum alloys, and tantalum.

12. A stent fabrication method as recited in claim 1, wherein said electro-chemical etching process employs a solution of phosphoric acid and sulfuric acid.

13. A stent fabrication method as recited in claim 1, wherein said electro-chemical etching process employs a solution of ferric chloride.

14. A stent fabrication method as recited in claim 1, wherein said electro-chemical etching process employs a solution of potassium cyanide.

15. A stent fabrication method as recited in claim 1, wherein said electro-chemical etching process employs a solution of sodium hypochloride.

16. A stent fabrication method as recited in claim 1, wherein said electro-chemical etching process employs a solution of hydrochloric acid and nitric acid.

17. A stent fabrication method comprising the steps of:

(a) coating an outer surface of a metallic tubular member with a photo-sensitive resist resulting in a coated tubular member, said metallic tubular member having an outside surface, an inside surface, and an inner lumen;

(b) placing said coated tubular member in an apparatus which simultaneously rotates said coated tubular member in conjunction with an advancing photographic film which regulates the exposure of a selected portions and shields other selected portion of said outer surface of said coated tubular member to a light source, yielding a partially exposed tubular member;

(c) immersing said partially exposed tubular member in a negative resist developer resulting in a treated tubular member;

(d) sealing said inner lumen; and

(e) processing the treated tubular member by chemical etching to remove a portion of uncovered metal.

18. A stent fabrication method as recited in claim 17, further comprising the step of processing said tubular member with a plasma etch treatment prior to the step of coating said outer surface of said metallic tubular member with said photo-sensitive resist.

19. A stent fabrication method as recited in claim 17, further comprising the step of coating said outer surface of said tubular member with a coupling agent prior to the step of coating said outer surface of said metallic tubular member with said photo-sensitive resist material.

20. A stent fabrication method as recited in claim 18, further comprising the step of incubating said treated tubular member in a temperature range, said temperature range being between 100 and 400 degrees Celsius, after the step of immersing said partially exposed tubular member to the negative resist developer.

21. A stent fabrication method as recited in claim 18, wherein said exposure of light source to portions of the stent is regulated by a stent configuration on transparent photographic film.

22. A stent fabrication method as recited in claim 19, further comprising the step of heating said tubular member in a temperature range, said temperature range being between 100 and 200 degrees Celsius, after the step of cleaning the tubular member.

23. A stent fabrication method as recited in claim 18, wherein said light source has a wavelength within the range of 360 to 440 nanometers.

24. A stent fabrication method as recited in claim 18, wherein said light source has a preferred wavelength optimized for the specific photoresist employed.

25. A stent fabrication method as recited in claim 19, wherein said coupling agent comprises a class of organo-silane compounds.

26. A stent fabrication method as recited claim 17, wherein a plurality of stents are made from a single piece of tubing .

27. A stent fabrication method as recited in claim 17, wherein said tubular member is made from a material selected from the group consisting of polymers, stainless steel, titanium, platinum, gold alloys, gold/platinum alloys, and tantalum.

28. A stent fabrication method as recited in claim 17, wherein said chemical etching process employs a solution of phosphoric acid and sulfuric acid.

29. A stent fabrication method as recited in claim 17, wherein said chemical etching process employs a solution of ferric chloride.

30. A stent fabrication method as recited in claim 17, wherein said chemical etching process employs a solution of potassium cyanide.

31. A stent fabrication method as recited in claim 17, wherein said chemical etching process employs a solution of sodium hypochloride.

32. A stent fabrication method as recited in claim 17, wherein said chemical etching process employs a solution of hydrochloric acid and nitric acid.

33. A stent fabrication method comprising the steps of:

(a) coating an outer surface of a metallic tubular member with a protective polymeric coating resulting in a coated tubular member, said metallic tubular member having an outside surface, an inside surface, and an inner lumen;

(b) placing said coated tubular member in an apparatus which simultaneously exposes a selected portion and shields other selected portions of said outer surface of said coated tubular member to a light source, resulting in some polymeric coating exposed and some polymeric coating unexposed, yielding a partially exposed tubular member;

(c) immersing said partially exposed tubular member in a solvent for selectively removing unexposed polymeric coating resulting in a treated tubular member;

(d) sealing said inner lumen; and

(e) processing said treated tubular member by chemical etching process to remove metal located in said selected portions of said tubular member.

34. A stent fabrication method as recited in claim 33, wherein said protective polymeric coating comprises a class of photo-sensitive resists.

35. A stent fabrication method as recited in claim 33, wherein said solvent for selectively removing unexposed polymeric coating comprises a class of negative resist developers.

36. A stent fabrication method as recited in Claim 33, further comprising the step of cleaning said tubular member prior to the step of coating said outer surface of said metallic tubular member with said protective polymeric coating.

37. A stent fabrication method as recited in Claim 33, further comprising the step of coating said outer surface of said tubular member with a coupling agent prior to the step of coating said outer surface of said metallic tubular member with said protective polymeric coating.

38. A stent fabrication method as recited in Claim 33, further comprising the step of incubating said treated tubular member in a temperature range, said temperature range being between 100 and 400 degrees Celsius, after the step of immersing said partially exposed tubular member to said solvent for selectively removing unexposed polymeric coating.

39. A stent fabrication method as recited in Claim 33, wherein said exposure of said light source to portions of said coated tubular member is regulated by a pattern imprinted on photographic film.

40. A stent fabrication method as recited in Claim 33, further comprising the step of heating said tubular member in a temperature range, said temperature range being between 100 and 200 degrees Celsius, after the step of cleaning the tubular member.

41. A stent fabrication method as recited in Claim 33, wherein said light source has a wavelength within the range of 360 to 440 nanometers with a preferred wavelength of 390 nanometers.

42. A stent fabrication method as recited in Claim 33, wherein said light source has a preferred wavelength optimized for the specific photoresist employed.

43. A stent fabrication method as recited in Claim 33, wherein said coupling agent comprises a class of organo-silane compounds.

44. A stent fabrication method as recited claim 33, wherein a plurality of stents are made from a single piece of tubing.

45. A stent fabrication method as recited in claim 33, wherein said tubular member is made from a material selected from the group consisting of polymers, stainless steel, titanium, platinum, gold alloys, gold/platinum, alloys and tantalum.

46. A stent fabrication method as recited in Claim 33, wherein said electro-chemical etching process employs a solution of phosphoric acid and sulfuric acid.

47. A stent fabrication method as recited in Claim 33, wherein said electro-chemical etching process employs a solution of ferric chloride.

48. A stent fabrication method as recited in Claim 33, wherein said electro-chemical etching process employs a solution of potassium cyanide.

49. A stent fabrication method as recited in Claim 33, wherein said electro-chemical etching process employs a solution of sodium hypochloride.

50. A stent fabrication method as recited in Claim 33, wherein said electro-chemical etching process employs a solution of hydrochloric acid and nitric acid.